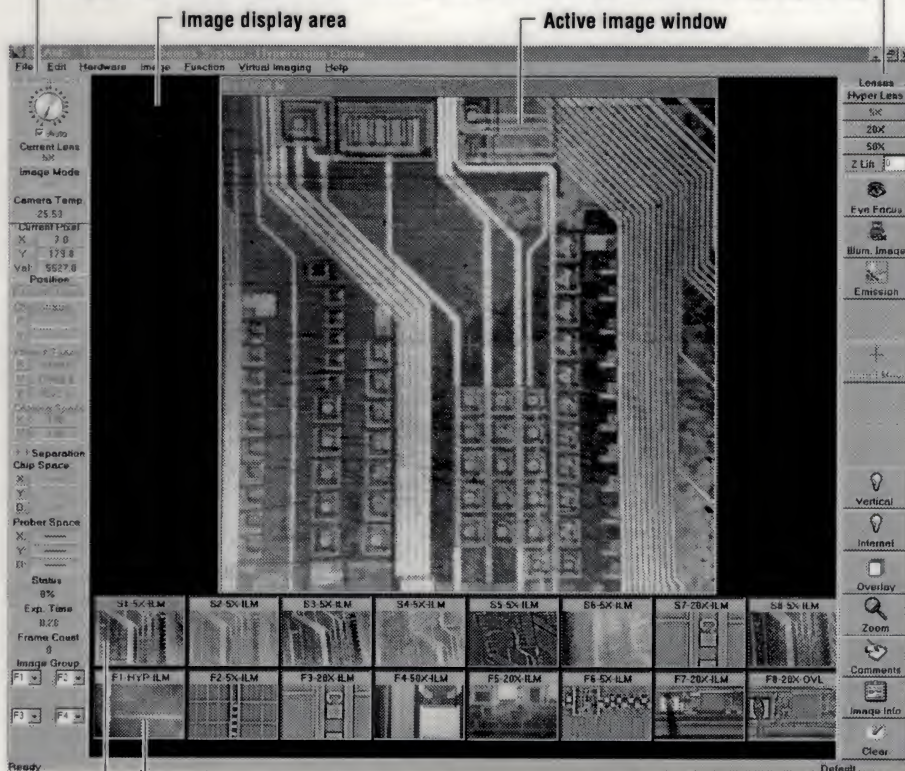


BEAMS™ System Software

QUICK REFERENCE CARD

Indicator panel: Lamp Indicator/Level Control, Current Lens, Image Mode, Camera Temperature, Current Pixel X/Y/Value, Chip Space X/Y, Prober Space X/Y/Z, Camera Space X/Y, Chip Space Separation X/Y/Distance, Prober Space Separation X/Y/Distance, Status (exposure progress bar), Exposure Time, Frame Count, Image Group Indicator/Selector

Control panel: Lens Selections, Z Lift Control, Eye Focus (on), Illuminated Image (start), Emission Image (start), Stop (image acquisition), Move/Live Move/Store Move (recenter image), Full Scale (restore default region of interest), Vertical Lamp (optic tube illumination on), Internal Lamp (enclosure illumination on), Overlay (combine illumination and emission images), Zoom (enlarge saved image view), Comments (create text overlay on saved image), Image Information (opens file data window), Clear (removes all image windows from image display area)



Fixed image stack: F1 – F8 (Right-click drag an active or scratch image to the fixed image stack)
Scratch image stack: S1 – S8 (Active image is automatically saved to the scratch image stack)

Red cross hair and indicator panel headings indicate position and coordinates referenced to a left-clicked location marker.
Green cross hair and indicator panel headings indicate position and coordinates referenced to a right-clicked location marker.
Blue indicator panel headings indicate default state with no active image, or coordinates referenced to the exact center of an active image.

Illuminated Image Acquisition

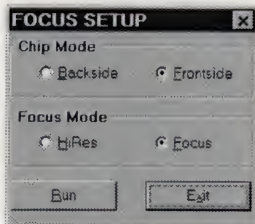
To quickly acquire an illuminated image:

- 1 Click Illum. Image in the control panel.



- 2 In the Focus Setup dialog:

- Select Backside or Frontside under Chip Mode.
- Select Focus under Focus Mode (0.1 seconds/ frame exposure time).
- Click Run.



- 3 The vertical lamp is automatically activated, with Auto selected by default.

- The illumination level can be manually controlled by deselecting Auto, and clicking the circumference of the lamp dial.

- 4 The Acquired Image window appears.

- The red cross hair marker designates the focal center of the acquired images.
- To recenter the image, click on the desired feature to position a cross hair marker, and click Live Move.

- 5 The Enhancement & Focus dialog appears simultaneously with the Acquired Image window, with default settings applied for brightness, contrast, and sharpness.



- To use the Auto Focus command click Coarse. This begins a focusing process that entails an upward z-axis movement of the scope in large increments until a general focal range is reached. The process then automatically switches to focusing in the Fine mode which entails scope movement in smaller increments in either direction on the z-axis until focus is optimized.

- 6 Illuminated images are acquired in continuous succession, with each succeeding image replacing its predecessor in the active image window. When the image is satisfactory, click Stop in the control panel.



- The final image of the sequence is then acquired in the HiRes mode (0.9 seconds/ frame exposure time), and saved to S1.
- The total number of images acquired is displayed in the Frames field.
- Each saved image is automatically assigned a file name that includes the image stack pane number, the lens used to acquire it, and the type of acquisition. For example: S1-5X-ILM.

- 7 As subsequent images are acquired and saved to buffer memory, they are displayed initially in the S1 pane, and shuttled sequentially into panes S2 – S8.

Emission Image Acquisition

To quickly acquire an emission image:

- 1 Set up the DUT or wafer to acquire an emission image.

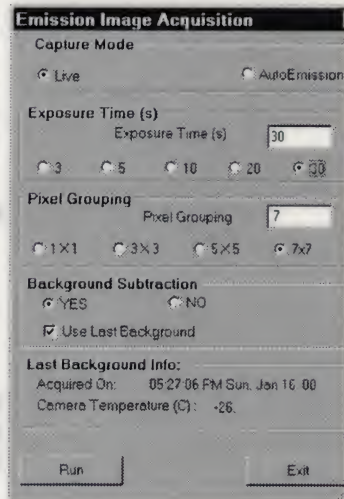


- 2 Shut the microscope enclosure doors.

- 3 Click Emission in the control panel.

- 4 The Emission Image Acquisition dialog appears.

- The Live Capture Mode is the default selection.



The AutoEmission mode is an option not installed on all systems (see the *BEAMS System Software User Guide* for further information).

- Under Exposure Time(s), select from the default options (3, 5, 10, 20, or 30 seconds).

- Under Pixel Grouping, select from the default options (1x1, 3x3, 5x5, or 7x7).

Smaller pixel groups produce a higher resolution image with decreased sensitivity. Larger pixel groups produce a lower resolution image with increased sensitivity.

- Under Background Subtraction, if you select yes, and the Use Last Background option is selected, the Emission Image Acquisition dialog expands to display Last Background Info, and the background image appears in an active image window.

- If Background Subtraction is deselected, a new background image is automatically acquired, and appears in an active image window.

- To begin emission image acquisition, click Run.

5 The Backside Inspection Windows Application dialog appears with a reminder to apply power to the device being tested.

- Confirm that power is applied to the device being tested, and click OK.

6 Live mode emission images are acquired in continuous succession, with the data from each emission image cumulatively added to that of the previous image, allowing the luminance to build to visible levels. This is in contrast to illuminated image acquisition, where each succeeding image replaces its predecessor in the active image window.

- The total number of images acquired is displayed in the Frames field.

- The exposure progress of each image acquisition is displayed by the status indicator.

7 When the image quality is satisfactory, click Stop in the control panel.

- The final image of the sequence is saved to S1.

- Each saved image is automatically assigned a file name that includes the image stack pane number, the lens used to acquire it, and the type of acquisition. For example: S1-5X-EMS.

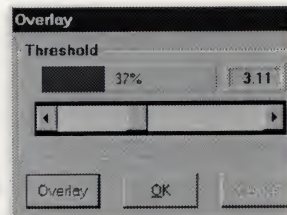


Image Overlay Procedures

To overlay corresponding emission and illuminated images, select their respective panels in the image stack, and click Overlay in the control panel.



- 1 In the Overlay dialog, specify emission image saturation by moving the Threshold slide bar, and click Overlay. If the initial result is not satisfactory, you can repeat this process as many times as necessary.



- 2 When you have an optimal saturation value, click OK

To adjust contrast and brightness of a saved overlay image:

- 1 Double-click the overlay image to open it in the active image window, or select File > Open to open a file saved to an outside directory.

- 2 Select Image > Alter Contrast.

- 3 In the Alter Contrast dialog:

- To adjust the illumination image contrast and brightness, click-drag the slider controls.

- To adjust the emission image contrast and brightness, click-drag the slider controls.

- To adjust the emission image threshold, click-drag the slider controls.

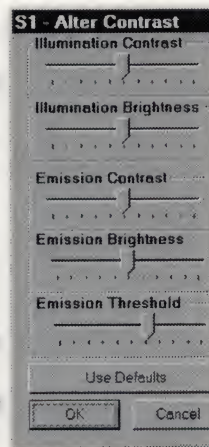
- To restore the original contrast, brightness, and threshold levels, click Use Defaults.

- 4 To apply the adjustments, click OK.

To convert a saved overlay image file back to the original emission and illumination image files, open the image, and select Function > Separate Overlay.

- 1 Under Extract, select Emission or Illumination.

- 2 Click OK.



BEAMS System Software Menu Commands

File

Open... Ctrl+O
Print
Print Group
Save ..
Save Group
Log On
Exit

Hardware

Eyepiece Lamp
Int. Lamp
Vertical Illum.
Controller
Calibration ▶

Edit

Copy Clipboard
Arrows and Comments

Calibration ▶

ParCenter
PixelSize
Turret Calibration

Image

Illum. Image
Emission
Scan Image
Mirror [Flip X]
Zoom
Change Pal
Line Scan
Area Scan
Enhance
Alter Contrast
Stop

Function

Overlay
Separate Overlay
Image Info
Display Group
Full Scale
Difference
Remap Difference
Stored Move
Clear Frame
Define Chip Space ▶
JoyStick

Help

Beams Help

Define Chip Space ▶

JoyStick

Define Origin And Axis
Set Four Points